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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/826,733	04/16/2004	Masataka Shinoda	075834.00485	1364
33448	7590	11/01/2007	EXAMINER	
ROBERT J. DEPKE			GOMA, TAWFIK A	
LEWIS T. STEADMAN				
ROCKEY, DEPKE & LYONS, LLC			ART UNIT	
SUITE 5450 SEARS TOWER			PAPER NUMBER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/826,733

Applicant(s)

SHINODA, MASATAKA

Examiner

Tawfik Goma

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 5-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2 and 5-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

This action is in response to the amendment filed on 8/16/2007.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 5, 8-9 and 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knight et al (US 6243350) in view of Okubo (US 2003/0118936).

Regarding claim 1, Knight discloses an optical recording system including a recoding/reproducing optical head having an objective lens (fig. 30b) and an optical recording medium recorded and reproduced with irradiation of light thereon from said optical head, said irradiation of light being made by an objective lens of which numerical aperture is larger than 1 to record and reproduce recorded pits (col. 35 lines 57-63, NA=NA of Objective lens (.65) x Refractive index of SIL (2) = 1.3), said optical recording medium comprising at least a silicon oxide layer and a recording layer being formed over a substrate, in that order (col. 37 line 12). Knight further discloses wherein said recording layer has formed thereon a protective layer of which refractive index is larger than a numerical aperture of said objective lens (SiN, col. 37 line 12 and lines 3-6). Although Knight discloses that the any write-once, or phase change material can be used as the recording layer, he fails to disclose a silicon recording layer. In the same field of endeavor, Okubo discloses a recording medium with a silicon recording layer (par. 83). It would have been obvious to one of ordinary skill in the art to use a silicon

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recording layer as taught by Okubo in the recording medium taught by Knight. The rationale is as follows: One of ordinary skill in the art would have been motivated to use a silicon recording layer as a suitable write-once recording material since Knight (col. 29 lines 44-67) suggests using any suitable write-once recording material and Okubo teaches that silicon is a suitable write-once material.

Regarding claim 2, Knight in view of Okubo disclose everything claimed as applied above. Further in regard to claim 2, it is known that silicon is oxidized when irradiated by a recording laser, and pits are formed by changing silicon to silicon-oxide by the recording laser.

Regarding claim 5, claim 5 is rejected for the same reasons as claims 1 and 2 above.

Regarding claims 8 and 9, Knight further discloses wherein the recording layer and the protective layer each have a refractive index greater than the numerical aperture of the objective lens (col. 35 lines 65-67). Furthermore, in the combination of Knight and Okubo, a silicon recording layer is provided as a recording layer. Okubo further discloses wherein the silicon recording layer has a refractive index that would be much greater than the numerical aperture of the objective lens (Table 1, page 6).

Regarding claims 12 and 13, Okubo further discloses wherein the refractive index of the silicon recording layer is greater than or substantially equal to 3 (Table 1, page 6)

Regarding claims 14 and 15, Knight further discloses wherein the refractive index of the silicon oxide layer is substantially equal to 1.5 (col. 35 line 66).

Regarding claims 16 and 17, Knight further discloses wherein said objective lens includes a solid immersion lens (SIL) shaped like a conical surface (figs. 6 and 7).

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Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knight et al (US 6243350) in view of Okubo (US 2003/0118936) and further in view of Harigaya et al (US 5095479).

Regarding claims 6 and 7, Knight in view of Okubo fail to disclose using a protective layer made of a material selected from HfO_2 , ZrO_2 , boron nitride and diamond. In the same field of endeavor, Harigaya discloses using a protective layer made of ZrO_2 (col. 4 lines 20-23). It would have been obvious to one of ordinary skill in the art to provide a protective layer formed of ZrO_2 . The rationale is as follows: One of ordinary skill in the art at the time of the applicant's invention would have provided a protective layer made of ZrO_2 as a simple substitution of one known element for another known element in the art which would yield predictable results.

Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knight et al (US 6243350) in view of Okubo (US 2003/0118936) and further in view of Nakayama et al (US 5644566).

Regarding claims 10 and 11, Knight in view of Okubo fail to disclose wherein the protective layer is made of a material selected from the group consisting of SrTiO_3 and diamond like carbon. In the same field of endeavor, Nakayama discloses the use of SrTiO_3 as a protective layer (col. 30 lines 24-30). It would have been obvious to one of ordinary skill in the art to provide a protective layer formed of SrTiO_3 . The rationale is as follows: One of ordinary skill in the art at the time of the applicant's invention would have provided a protective layer made of SrTiO_3 as a simple substitution of one known element for another known element in the art which would yield predictable results.

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Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knight et al (US 6243350) in view of Okubo (US 2003/0118936) and further in view of Nakayama et al (US 5644566).

Regarding claims 18 and 19, Knight further discloses wherein the objective lens includes an SIL (3012, fig. 30b), but fails to disclose wherein the SIL has a main component material selected from the group consisting of ZrO_2 , SrTiO_3 , $\text{Bi}_4\text{Ge}_2\text{O}_{12}$, and $\text{Bi}_4\text{Ge}_3\text{O}_{12}$. In the same field of endeavor, Cozier discloses an SIL with a main component material ZrO_2 (col. 11 lines 17-22). It would have been obvious to one of ordinary skill in the art to provide an SIL with a main component material of ZrO_2 . The rationale is as follows: One of ordinary skill in the art at the time of the applicant's invention would have provided an SIL with a main material component of ZrO_2 as a simple substitution of one known element for another known element in the art which would yield predictable results.

Response to Arguments

Applicant's arguments filed 8/16/2007 have been fully considered but they are not persuasive. Regarding applicant's arguments that Knight fails to disclose forming the recording layer over an SiO_2 layer because Knight forms the recording layer directly on the substrate, this argument is not persuasive because it is clear in Knight's disclosure (col. 37 line 12) that a $\text{SiN}/\text{MO}(\text{recording layer})/\text{SiO}_x/\text{SiN}/\text{Al}/\text{Substrate}$ structure is formed, thereby forming a recording layer on a SiO_x or SiO_2 layer (see col. 37 lines 64-67 through col. 38 lines 1-2).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tawfik Goma whose telephone number is (571) 272-4206. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (571) 272-7589. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tawfik Goma/
10/24/2007.

/William Korzuch/
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